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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
YAM, STEPHEN K	

ART UNIT	PAPER NUMBER
2878	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/085,373	ALBATS ET AL.	
	Examiner	Art Unit	
	Stephen Yam	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *23-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0604*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to Amendments and remarks filed on June 17, 2004. Claims 1-30 are currently pending.

Election/Restrictions

1. Newly submitted claims 23-30 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claims 23-30 are directed towards an apparatus having a first rate of rotation for a support and a second rate of rotation for a sensor in a direction opposite to the first rate of rotation with a relationship between the first and second rates of rotation such that the orientation of the sensor remains substantially constant with respect to the direction of movement of the apparatus. The details of the first and second rates of rotation were not disclosed in the original filed claims and are patentably distinct from Claims 1-22, which do not recite any limitations regarding the rates of rotation.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 23-30 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemelson US Patent No. 4,636,137 in view of Fuereder et al. US Patent No. 5,129,308.

Regarding Claim 1, Lemelson teaches (see Fig. 3) a movable sensor apparatus (7) comprising a movable housing (20), at least one supporting extension (11) wherein each supporting extension is rotatably affixed (see Col. 6, lines 28-33) to said housing, being fully rotatable about a first (vertical) axis (as supporting extension (11) is rotated using a standard motor (19) through gears (19S) and there are no components placed that obstruct the rotation of the supporting extension (11)), at least one sensor (34) rotatably affixed (see Col. 11, line 66 to Col. 12, line 5) to one of said at least one supporting extension about a second (horizontal) axis different from said first axis, a linear propulsion mechanism (VM1) attached to said housing whereby said housing may be moved over the ground (see Col. 6, lines 34-42), a triggering unit (59) (see Col. 9, lines 23-26) electrically coupled to each of said at least first sensor and capable of separately activating each of said at least one sensor, and a sampling unit (50) electrically coupled to each of said sensor and capable of receiving output from each of said at least one sensor (see Col. 7, lines 34-46). Regarding Claim 3, Lemelson teaches the sensor as an optical camera (see Col. 6, lines 19-22). Lemelson does not teach the second axis substantially parallel to and offset from the first axis, or the first and second axes substantially perpendicular to the ground. Fuereder et al. teach (see Fig. 1 and 7) a similar apparatus, with movable housing (1), a first supporting extension (2) rotatably affixed to said housing, being fully rotatable (using (6)) about a first (vertical axis through (6)) axis (see Fig. 7), a second supporting extension (2a)

rotatably affixed to said housing, being fully rotatable (using (6)) about a first (vertical axis through (6)) axis (see Fig. 7), a first sensor (3) (see Col. 3, lines 47-52) that is rotatably affixed to said first supporting extension (see Fig. 7), being fully rotatable about a second axis (vertical through (3)) (see Fig. 7 and Col. 3, lines 38-41) substantially parallel to and offset from said first axis, and a second sensor (3a) that is rotatably affixed to said first supporting extension (see Fig. 7), being fully rotatable about a third axis (vertical through (3a)) (see Fig. 7 and Col. 3, lines 38-41) substantially parallel to and offset from said first axis and said second axis (see Fig. 7), wherein the first, second, and third axes are substantially perpendicular to the ground. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the second axis substantially parallel to and offset from said first axis and the first and second axes substantially perpendicular to the ground as taught by Fuereder et al. in the sensor of Lemelson, to increase the range of motion of the apparatus for increased mechanical effectiveness and utility.

4. Claims 1-20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Das et al. US Patent No. 6,333,631 in view of Lemelson, further in view of Fuereder et al.

Regarding Claims 1-6, 8, 10, 12, 14, 15, and 17-20, Das et al. teach (see Fig. 1) a movable sensor apparatus (7) comprising a movable housing (6), at least one supporting extension (2,25) wherein each supporting extension is rotatably affixed (see Fig. 4) to said housing about a first (Z) axis, at least one sensor (3,4,5) rotatably affixed (see Fig. 4) to one of said at least one supporting extension about a second (Z_3,Z_5) axis different from said first axis, a triggering unit (see Col. 2, lines 39-46) electrically coupled to each of said at least first sensor

and capable of separately activating each of said at least one sensor, and a sampling unit (see Col. 2, lines 43-46) electrically coupled to each of said sensor and capable of receiving output from each of said at least one sensor. Since Das et al. teach the housing as wheeled and traversing the ground (see Col. 3, lines 43-45), inherently a linear propulsion mechanism is included to move the vehicle relative to the ground by rotation of the wheels. Regarding Claim 10, Das et al. teach a movable sensor apparatus comprising a movable housing (6), a first supporting extension (2) rotatably affixed (see Fig. 4) to said housing about a first (Z) axis, a second supporting extension (25) rotatably affixed (see Fig. 4) to said housing about said first (Z) axis, a first sensor (3) rotatably affixed (see Fig. 4) to said first supporting extension about a second (Z_3) axis different from said first axis, a second sensor (4, 5) rotatably affixed (see Fig. 4) to said second supporting extension about a third (Z_5) axis different from said first and second axes, a triggering unit (see Col. 2, lines 39-46) electrically coupled to said first and second sensor and capable of separately activating said first and second sensor, and a sampling unit (see Col. 2, lines 43-46) electrically coupled to said first and second sensor and capable of receiving output from said first and second sensor. Since Das et al. teach the housing as wheeled and traversing the ground (see Col. 3, lines 43-45), inherently a linear propulsion mechanism is included to move the vehicle relative to the ground by rotation of the wheels. Regarding Claim 2, Das et al. teach the sensor (3) as a magnetometer (see Col. 4, lines 26-37). Regarding Claim 3, Das et al. teach the sensor (4) as an optical camera, as the sensor contains an optical position encoder (which inherently comprises a camera to detect position from the optical signal emitted from the laser source) (see Col. 7, lines 45-54). Regarding Claim 4, Das et al. teach the sensor (3) as a metal detector (see Col. 4, lines 26-30)- inherently, a metal detector is an electromagnetic

induction sensor. Regarding Claim 5, Das et al. teach the sensor (5) as a sonar sensor (see Col. 4, lines 50-59). Regarding Claim 6, Das et al. teach the supporting extension as rotating at a constant rate of rotation (see Col. 6, lines 59-61 and Col. 7, lines 49-51). Regarding Claim 8, Das et al. teach (see Fig. 1) a position indicator (4, 5) coupled to the supporting extension (see Col. 5, lines 47-50). Regarding Claim 12, Das et al. teach the first sensor (3) as a radar sensor (see Col. 4, lines 26-37) and a second sensor (4) as an optical camera (see Col. 7, lines 45-54). Regarding Claim 14, Das et al. teach the first sensor (3) as a radar sensor (see Col. 4, lines 26-37) and a second sensor (5) as a sonar sensor. Regarding Claim 15, Das et al. teach the first sensor (3) as a magnetometer (see Col. 4, lines 26-37) and a second sensor (4) as an optical camera (see Col. 7, lines 45-54). Regarding Claim 17, Das et al. teach the first sensor (3) as a magnetometer (see Col. 4, lines 26-37) and a second sensor (5) as a sonar sensor. Regarding Claim 18, if the references to a first and second supporting extension and sensor are reversed ("first"->"second" and "second"->"first"), Das et al. teach the first sensor (4) as an optical camera (see Col. 7, lines 45-54) and a second sensor (3) as an electromagnetic induction sensor (see Col. 4, lines 26-37). Regarding Claim 19, Das et al. teach the first sensor (4) as an optical camera and a second sensor (5) as a sonar sensor. Regarding Claim 20, Das et al. teach the first sensor (3) as an electromagnetic induction sensor (see Col. 4, lines 26-37) and a second sensor as a sonar sensor (5). Das do not teach the first (and second) support extensions as *fully* rotatable about the first axis, the first sensor as *fully* rotatable about the second axis, and the second sensor as *fully* rotatable about the third axis, the second axis substantially parallel to and offset from the first axis, the third axis substantially parallel to and offset from the first axis and the second axis, or the first, second, and third axes substantially perpendicular to the ground. Lemelson teaches (see

Fig. 3) a movable sensor apparatus comprising a movable housing (20), a supporting extension (11) rotatably affixed (see Col. 6, lines 28-33) to the housing, fully rotatable about a first (vertical) axis (as supporting extension (11) is rotated using a standard motor (19) through gears (19S) and there are no components placed that obstruct the rotation of the supporting extension (11)), a sensor (34) rotatably affixed (see Col. 11, line 66 to Col. 12, line 5) to the supporting extension, being fully rotatable (since it uses a similar motor as the motor (19) used to rotate the supporting extension (11)- see Col. 12, lines 1-5 and there is no obstruction for the rotation about the second axis) about a second (horizontal) axis different from said first axis, and a linear propulsion mechanism (VM1) attached to said housing whereby said housing may be moved over the ground (see Col. 6, lines 34-42). Das and Lemelson do not teach the second axis substantially parallel to and offset from the first axis, the third axis substantially parallel to and offset from the first axis and the second axis, or the first, second, and third axes substantially perpendicular to the ground. Fuereder et al. teach (see Fig. 1 and 7) a similar apparatus, with movable housing (1), a first supporting extension (2) rotatably affixed to said housing, being fully rotatable (using (6)) about a first (vertical axis through (6)) axis (see Fig. 7), a second supporting extension (2a) rotatably affixed to said housing, being fully rotatable (using (6)) about a first (vertical axis through (6)) axis (see Fig. 7), a first sensor (3) (see Col. 3, lines 47-52) that is rotatably affixed to said first supporting extension (see Fig. 7), being fully rotatable about a second axis (vertical through (3)) (see Fig. 7 and Col. 3, lines 38-41) substantially parallel to and offset from said first axis, and a second sensor (3a) that is rotatably affixed to said first supporting extension (see Fig. 7), being fully rotatable about a third axis (vertical through (3a)) (see Fig. 7 and Col. 3, lines 38-41) substantially parallel to and offset from said first axis and

said second axis (see Fig. 7), wherein the first, second, and third axes are substantially perpendicular to the ground. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide each supporting extension as *fully* rotatable, as taught by Lemelson, and to provide the second axis substantially parallel to and offset from said first axis and the first, second, and third axes substantially perpendicular to the ground, as taught by Fuereder et al., in the apparatus of Das, to increase flexibility and range of movement of the sensors in the apparatus for increased mechanical effectiveness and utility to provide easier sensor operation in rough terrain conditions.

Regarding Claim 7, Das et al. in view of Lemelson and Fuereder et al. teach the apparatus as taught in Claim 6, according to the appropriate paragraph above. Das et al. do not teach each sensor rotating at a constant rate of rotation equal in magnitude to the rate of rotation of the supporting extension. It is well known to rotate sensors constantly in a certain direction to capture surrounding information and to use identical motors in a device to simplify its production and lower repair costs. It would have been obvious to one of ordinary skill in the art at the time the invention was made to rotate each sensor in an opposite direction at an equal rate of rotation in the apparatus of Das et al. in view of Lemelson and Fuereder et al., to provide a low-cost method of obtaining accurate distance data in all directions, to gather further environmental sensor data.

Regarding Claim 9, Das et al. in view of Lemelson and Fuereder et al. teach the apparatus as taught in Claim 6, according to the appropriate paragraph above. Das et al. also teach a computer system (see Col. 3, lines 46-49) attached to the apparatus. Das et al. do not teach a data storage device for storing sensor data collected the sensor and position data collected from

the position indicator. It is well known to capture sensor and positional data, to map a large terrain containing hazardous objects. It would have been obvious to one of ordinary skill in the art at the time the invention was made to store the sensor and positional data in the apparatus of Das et al. in view of Lemelson and Fuereder et al., to provide determine the precise location of mines to map an area for hazardous objects.

Regarding Claims 11, 13, and 16, Das et al. in view of Lemelson and Fuereder et al. teach the method as taught in Claim 6, according to the appropriate paragraph above. Das et al. do not teach two different sensors chosen from the list of a magnetometer, radar sensor, or electromagnetic induction sensor. It is well known to use two separate sensors in a sensor apparatus, to improve detection accuracy and reduce false readings. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use at least two different sensors chosen from the list of a magnetometer, radar sensor, or electromagnetic induction sensor in the apparatus of Das et al. in view of Lemelson and Fuereder et al., to further improve the detection of mines and other metallic objects as desired by Das et al.

Response to Arguments

5. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SY

THANH X. LUU
PATENT EXAMINER